SCIENCE IN GERMANY

(*From a German Correspondent.*)

SINCE Darwin first gave the signal for a complete rupture with the old tradition of the morphology of animals, Germany has zealously continued working in the new direction, trying to bring anatomical, embryological, and biological facts into causal connection with each other by the comparative method. Darwin's theory remains the basis, and it has been principally Haeckel who, in advance of all its supporters, deduced further important consequences; the antagonists of the theory have confined themselves to a purely negative criticism. At one time the whole theory with all its suppositions and deductions was rejected by them; at another, the theory of descent was accepted in principle, but the further representation of its connection with the anatomy and the development history of animals was refuted; in all cases they either returned to the old views openly or they were satisfied with simple contradiction, leaving it to the future to fill up the gaps thus produced in the theory. In a work that has lately been published, the attempt has been made to consider the whole science of the morphology of animals from a different point of view. This work is: "Die Entwicklungsgeschichte der Unke als Grundlage einer vergleichenden Morphologie der Wirbelthiere" (the History of Development of *Bombinator igneus* as the basis of a Comparative Morphology of Vertebrata), by Dr. Alexander Götte, Professor of the University of Strassburg.

From a careful examination of the individual history of the development of Vertebrata and comparative consideration of the lower types, Götte tries to determine the morphological laws for the individual species, and from this to deduce their causal connection; he thus arrives at certain general theorems which, according to his view, form the basis for a conception of the origin of new animal species, totally different from Darwin's view. On the one side Götte does not look upon the animal ovum as a cell, nor in fact as a living organism at all; this of course is different from all other theories hitherto published. According to his view the cells, which are the basis of the formation of the ovum, only produce a conglomeration of a certain material (yolk) in a certain arrangement, but are themselves dissolved sooner or later, so that the complete ovum is a peculiar body, not living, but endowed with properties that enable it to be converted into a living organism under certain conditions. He maintains that this capacity for development is not the simple consequence of the chemical composition of the yolk, but that it only contains the motive force which is freed by chemical processes, and can do very different work according to the physical conditions under which it happens to be. The result may therefore as likely be the destruction of the ovum as its further development. For the latter, perfectly certain conditions of form are necessary, which have already been initiated during the formation of the ovum, and cause the force in question to work in a direction just as determined and certain as they are themselves. The results in that case are self-divisions of the yolk, when the parts are either of equal or of different sizes, and produced at different intervals. The former separate very soon and form separate individuals, which therefore consist only of one element and represent the lowest type (Protozoa); the ova of Matazoa, which are unequally divided according to a certain law, remain whole. Their coarser formation is brought about in a purely mechanical way, each division causing a displacement.

Thus Dr. Götte finds the basis of the fundamental structure, the type of each animal species, in the differences originating through the laws regulating the first divisions of the yolk.

NOTES

AN Exhibition of 50*l*. a year, tenable for four years, was recently devoted by the Endowed Schools Commission for annual competition between the four schools of Taunton, Tiverton, Exeter, and Sherborne. The details of the competition were left entirely to local trustees, whose names we do not know, but whom we understand to be gentlemen of the county of Somerset. The regulations issued by the trustees are before us. They very properly order that the examination shall be conducted by the Oxford and Cambridge Schools Examination Board. The subjects proposed by that Board include four groups, of which Science is one, and all candidates, whether choosing to take up Science or not, are permitted, if they please, to substitute Botany for Latin Verse, and Physical Geography for Greek Prose Composition. The scheme of the Somersetshire trustees includes all the subjects named by the Universities *except those which come under the head of Science*, refusing to permit any branch of science to form part of the examination, whether as an independent topic or as an alternative. We content ourselves for the present with the statement of a fact likely to interest all our readers, those more especially who are aware of the efforts that have been made during the past six years to establish in the county of Somerset a centre of first-rate scientific teaching.

AMONG the additional estimates recently voted by the House of Commons is one for the salary of an Assistant-Director to the Royal Gardens at Kew. Everyone will be rejoiced to hear that the arduous duties of the Director are likely to be lightened by this appointment, which has been filled up by the selection of Prof. Thiselton Dyer.

IN connection with the Commission appointed by the President of the United States to experiment and report upon the metals used in construction (NATURE, vol. xii. p. 94), Mr. R. H. Thurston, the Secretary, has issued circulars expressing his desire to secure the assistance of all who are interested in this great work, and through them to obtain all information available as the result of the labours of earlier or of contemporaneous investigators and observers. The circulars indicate the scope of the labours undertaken by this Commission, and request aid from all in a position to render it, in the collection of all information which may be accessible, relating to either the general work of the Commission or to the special subjects assigned to its committees. Data collected in the course of ordinary business practice, and the records of special researches previously made or now in progress, are particularly desired. It is expected that the Commission will receive valuable information and useful suggestions, both from business men and from men of science, and it is hoped that the work undertaken by the Commission may be supplemented by original investigations made by both these classes. The great importance of this work justifies the expectation of an earnest and effective co-operation. Part of the work of the Commission is the investigation of the methods and effects of Abrasion and Wear of metals in engineering and mechanical operations. Valuable data for the purpose could be furnished by railway engineers and others in regard to the wear of rails, wheels, axles, journals under heavy loads or at high velocities, the wear of tools, and other points, and we hope that all in this country who have it in their power will lend what aid they can to this important Commission. Another part of the Commission's work is a series of determinations of the effects of carbon, phosphorus, silica, manganese, and other elements, upon the strength, toughness, elasticity, and other qualities of iron and steel. Mr. A. L. Holley, Chairman of the Committee on Chemical Research, issues a circular giving detailed instructions as to the specimens and kind of information wanted. We should advise all interested to apply to Mr. R. H. Thurston, Stevens Institute of Technology, Hoboken, N.J., for detailed information; and we think the

Board would do well in sending circulars to the engineers of our principal railways, as well as to all others who are likely to be able to give them help in their laudable and valuable work.

We are informed that H.M.S. *Challenger* will have completed her cruise and be back in this country by April of next year.

The library of Audubon, the ornithologist, was destroyed by fire in April last. It was in the house of Mrs. Bakewell, the sister-in-law of Audubon, at Shelbyville, Ky.

The twenty-fourth annual meeting of the American Association for the Advancement of Learning will be held in Detroit, Mich., beginning on Wednesday, August 11 next, under the presidentship of Mr. J. E. Hilgard, of Washington.

Dr. Horner, the medical officer on board the *Pandora*, which left England yesterday for the Arctic seas, will take upon himself all the meteorological duties of the expedition. Lieut. Banyan, of the Dutch navy, will act as scientific officer, it being intended that botanical and marine research will form a prominent duty of the expedition. Hall's Esquimaux Joe also accompanies the expedition, and altogether there are thirty-two souls on board. Capt. Allen Young hopes to get as far north as Carey Island, at the entrance of Smith's Sound. On this island a "post-office" or cairn has existed for many years, and, accordingly, all the letters Capt. Allen Young takes with him for the *Alert* and *Discovery* will be deposited here, unless he falls in with one of those vessels. The commander of this new expedition will push to the north-west after leaving Carey Island, and if the *Pandora* succeeds in forcing a way through the north-west passage, as Capt. Allen Young hopes, she will be the first steamship to accomplish the marvellous feat. She may possibly return in November next.

In Part X. of the *Deutsche Rundschau* there is an excellent review of Capt. Lawson's wonderful book, "Wanderings in the Interior of New Guinea" (which we noticed in our issue of the 3rd inst., vol. xii. p. 83). The review is by Prof. A. B. Meyer, director of the Zoological Museum at Dresden. Like every sensible man, Prof. Meyer points out the absurdities with which this book is crammed. Indeed, he owns that he was almost of opinion that it was the author's intention to write a satire on modern narratives of travel, and that on the last page of the book the reader would be told of this; "but, unfortunately, Capt. Lawson is constantly in earnest; indeed, he left no stone unturned to make the book attractive, and to pass off its contents as real facts." Prof. Meyer dwells at some length on Capt. Lawson's marvellous mountain ascents, on his wonderful hunting feats, and his most surprising discoveries in the animal and vegetable world. He points out that with regard to the quadruped fauna it is well known that tigers are not found further eastward than Java, monkeys not further than Timor, and deer not further than Halmahera, and that it is incredible that these species, besides buffaloes, foxes, and hares, exist in New Guinea. Prof. Meyer, in conclusion, thinks it rather surprising that shortly after the publication of this wonderful book of fiction a deputation led by the Duke of Manchester should have waited upon the Colonial Secretary with a view to induce the Government to annex New Guinea. He asks, "Was this a consequence of the marvellous description of the distant country, or has the sensation novel been manufactured to order?"

A new steering balloon by Smitter is being exhibited, suspended in the middle of the Alcazar in Paris. The measurement is only 6,000 cubic feet, but the balloon is so light, that when filled with pure hydrogen it must float. A considerable sum of money has been invested in it, and great ability has been displayed in the construction. Although no practicable result in open air may be hoped for, it is a wonderful piece of clockwork. In connection with this subject it is stated that for several months past a firm of engineers have been experimenting privately at the Crystal Palace with an aërial steamer of a novel and promising character, weighing 160 lbs. Experiments are stated to have proved the capability of two vertical screws, each 12 feet diameter, to raise a weight of 120 lbs.; the steam-engine, with water and fuel, forming part of the weight so raised to the extent of 80 lbs. The power exerted by it is equal to two-and-a-half horses. The communication of motion is given by a vertical axis emanating from the car.

At a Congregation held on Friday, the report of the Cambridge Syndicate recommending the purchase by the University of the collection of models, instruments, and tools used by the late Prof. Willis was confirmed.

Capt. R. F. Burton writes to the *Times* stating that the Italian African Expedition, under the Marchese Antinori, is reported to have for its ultimate object the wholly unvisited section to the south-west of Christian Abyssinia and the Abai River, "connecting known countries with the so-called Victoria Nyanza Lake."

We regret to announce the death of M. Le Besgue, oldest Correspondent to the Geometry Section of the Paris Academy of Sciences. He died on June 12, at Bordeaux.

On Tuesday a deputation from the Highland and Agricultural Society of Scotland waited upon the First Commissioner of Works, to ask the Government to proceed with the Survey of Scotland, which had been for some years in abeyance, and also to allow it to be done on a 25-inch scale of maps. A memorial was handed in to show that the opinion of the Scotch people was that the Survey should be at once carried out. Lord Henry Lennox promised to give the subject his best consideration, and remarked that the applications for the same object from different parts of the United Kingdom made it difficult to obtain from the Treasury any grants for the purpose.

An important Report of a Committee of Council appointed to consider the requirements of Oxford University, as amended and adopted by Council, has been circulated for the information of members of Convocation. The "Requirements of the University" may be conveniently divided into Provision for Buildings and Institutions, and Provision for Professors and Teachers. Under the head of Buildings and Institutions, it is stated that with reference to the Botanic Garden, if it is to remain where it is, the lease being renewed, considerable amount of reconstruction is required, estimated at 4,000*l*. If it is to be removed to the Parks, a much larger outlay will be required. With regard to the University Museum, the heads of the three chief departments (Chemistry, Biology, Physics) report that additional buildings are required in each of the three, roughly estimated in all at 30,000*l*. Under the head of Provision for Professors and Teachers, the Committee find many demands which it is difficult to meet at once; one of their principal suggestions is the appointment of a Board for the following purposes:—1. To appoint lecturers from time to time to deliver lectures in the University on any subject that may seem to the Board to claim attention, and to assign payment to such lecturers. 2. To make occasional grants to individuals for the purpose of carrying on special work in connection with the studies or institutions of the University. 3. To appoint Readers for limited periods, not exceeding ten years, in subjects in which public teaching within the University may seem to the Board to be desirable; and to assign the stipends to such Readers; such appointments and the stipends being subject to the approval of Convocation. The

Board also, under certain conditions, might be entrusted with the duty of appointing Professors for life. It appears, however, that several additions to the permanent staff of Professors will be required. These must be provided for, the Report states, from time to time, by statute. Thus, for example, the following suggestions have been made with regard to the chief departments of study pursued in the Museum :—1. In the department of Chemistry it is stated that an additional professorship is required. 2. In the department of Physics also it is stated that an additional professorship is required. 3. In the department of Biology it is proposed—(*a*) That the present Linacre Professorship should become a Professorship of Human Anatomy and Ethnology. (*b*) That the Hope Professorship of Zoology should become a Professorship of Zoology and Comparative Anatomy. (*c*) That the Clinical Professorship of Medicine should become a Professorship of Physiology and Public Health.

A CORRESPONDENT sends us the enclosed cutting from *Le Français* as an illustration of how they do things in France :—"On sait que sur la proposition de M. de Cumont, ministre de l'instruction publique, des cultes et des beaux-arts, l'Assemblée a voté, le 18 juillet dernier, une pension annuelle et viagère de 12,000 fr. à M. Pasteur, membre de l'Institut, professeur à la Faculté des sciences de Paris, à titre de récompense nationale. Un nouveau décret, rendu par M. le maréchal de Mac-Mahon sur le rapport de M. Wallon, contre-signé par M. Leon Say, vient d'accorder une nouvelle pension de 6,000 fr. à M. Pasteur, indépendamment de celle de 12,000 fr. qui lui avait été donnée précédemment. De telles mesures ne peuvent qu'encourager nos hommes de science et stimuler l'esprit de découverte. Cette pension permettra donc d'assurer d'une manière digne de lui les jours d'un homme qui compte près de trente-trois années de services dévoués, et que les fatigues d'un travail assidu ont mis dans l'impossibilité de continuer à exercer ses fonctions de professeur."

LAST Thursday, in the House of Commons, in reply to a question by Sir John Lubbock, the Chancellor of the Exchequer said he would be ready to consult with his colleagues in the course of the autumn to see whether the object of preserving the ancient monuments of the country could in any way be carried out. Sir J. Lubbock, considering this a favourable answer, said he would withdraw his Ancient Monuments Bill.

A SPECIMEN of a sturgeon, eight feet in length, has been added to the Manchester Aquarium. Several examples of the Wolf, or Cat Fish, and three of the Monk, or Angel Fish, each five feet long, are also to be seen in the same building.

DURING this season the *Morning Post* has made a speciality of noticing the proceedings of some of the learned societies. The lectures at the Royal Institution have generally occupied half a column, and some of the popular lectures of the Zoological Society have been given at equal length. In a notice of one of the ladies' lectures of Prof. Bentley at the Botanic Society is this passage :—"Future historians of the social condition of the people of England at our period will have to make constant reference to the daily press, and it is therefore but right, alongside of the notices of the culture of music and the sister fine arts, to record each attempt to spread the knowledge acquired by men of science." We are glad the *Morning Post* has set so good an example.

PROF. NORDENSKJÖLD's expedition left Tromsö for Novaya Zemlya on June 8. The expedition is undertaken on board the Norwegian Arctic sea-yacht *Pröven*, Capt. J. N. Isaksen, who has been to Spitzbergen and Novaya Zemlya a great many times previously. On the southern coast of the latter island the party expect to meet with Samoyedes; they intend then to move in an easterly direction, towards the rivers Obi and Yenesei. Prof. Nordenskjöld will then leave the ship to continue the expedition by boat.

THE so-called tobacco-meal, the *Kölnische Zeitung* says, has been successfully used in agriculture for the destruction of noxious insects, but it has not yet been applied largely on account of its high price, which is caused by heavy import duty. The Prussian Minister for Agriculture has just addressed a letter to the Minister for Commerce with a view to reduce this duty or to take it off entirely. The only obstacle lies in the fact that the meal might be used for the manufacture of snuff. A Hamburg firm is said to have a stock of over thirty tons of this meal.

WE regret to learn that Mr. Alexander Agassiz, director of the Anderson School of Natural History, has been unable to make arrangements for a third session of this establishment during the present summer. He announced some time ago that, in view of the expense of the enterprise and the limited funds at his command, it would be impossible for him to proceed unless a sufficient number of students could be found willing to pay fifty dollars for the course. This appeal not proving effectual, he has given notice that the school will not be opened during 1875.

THE French Minister of Public Instruction has established a new commission to report on the state of meteorology and the improvements to be introduced in the system of observations, as hitherto practised at the Observatories of Paris and Montsouris, and other public establishments.

COL. MONTGOMERIE, the representative at the International Geographical Congress of the Royal Geographical Society and the Indian Survey Office, has arrived in Paris. A representative of the English Admiralty is expected very shortly. It is hoped that the Admiralty will send to Paris one of the magnificent yachts of the English navy for exhibition during the Congress. An immense quantity of goods for exhibition is stated to have already arrived from London.

THE death of Mr. Thomas Baines, the African traveller, is announced.

AT the last meeting of the Edinburgh Botanical Society, the *British Medical Journal* states, Dr. T. A. G. Balfour reported some interesting experiments on the *Dionœa muscipula*, which he considered a carnivorous plant. He showed that the irritability under which the leaf contracts is resident in six delicate hairs, so placed on the surface of the leaf that no insect could avoid touching them in crawling over. Chloroform dropped on a hair caused the leaf to close immediately; water had no such effect. Contraction only lasted for a considerable time when any object capable of affording nutrition was seized, when it lasted for about three weeks, and the interior of the leaf gave out a viscous acid secretion. A number of interesting points were made out with regard to the secretion, digestion, and absorption performed by the plant.

THE additions to the Zoological Society's Gardens during the past week include two Dorsal Squirrels (*Sciurus dorsalis*) from West Mexico, presented by Mr. John G. Haggard; a Yellow-shouldered Amazon (*Chrysotis ochroptera*) from South America, presented by Miss Amelia Grove Grady; a Grison (*Galictis vittata*) from South America, a Hobby (*Hypotriorchis subbuteo*), European, a Humboldt's Lagothrix (*Lagothrix humboldti*) from the Upper Amazon, purchased; ten Summer Ducks (*Aix sponsa*), seven Spotted-billed Ducks (*Anas pœcilorhyncha*), four Temminck's Tragopans (*Ceriornis temminckii*) bred in the Gardens.